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MISCELLANEOUS NOTES ON NEW ENGLAND FERNS AND ALLIES.

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DURING the preparation of the series of Notes here proposed it is the author's intention to jot down from time to time such observations on the character, habits, and habitats of our New England Pteridophytes as may appear to be worthy of special record, and incidentally to ascertain and establish the range of the different species throughout the New England States; also to secure specimens for verification from as many localities as possible to deposit in the Herbarium of the New England Botanical Club as a part of the work on its proposed revision of the New England Flora.

To this end the co-operation of New England fern students is requested, and specimens — especially of unusual forms — with such data as may be necessary for accurate descriptions of plants, and habitats, solicited.

Full credit will be given for all assistance rendered, and the author will gladly reciprocate in every way that he can. Special sendings for identification will be returned to sender on request provided stamps are furnished for return postage, and all specimens may be sent direct to author's address, 67 Fellsway West, Medford, Mass.

1. DEVELOPMENT OF THE SPOROPHYLL IN OSMUNDA AND STRUTHIOPTERIS. — It is very commonly believed that the fertile fronds, the sporophylls, in *Osmunda* are developed from the centre of the crown, and are surrounded by a circle of sterile fronds, yet careful observation shows that this is an error due to a false appearance of the plant at maturity, and a superficial examination.

Nearly all writers who have mentioned the matter at all have de-

scribed the fertile fronds of *Osmunda cinnamomea* as arising from the centre of a crown the sterile fronds of which surround the fertile in the form of a vase, and Mr. Clute, in his recent very beautiful fern book, has been the first to describe accurately the fact that the fertile fronds arise from the outside part of the series, and that the appearance of the mature plant is due to the angle of ascension through which the growing fronds reverse their natural order.

It is possible, however to infer from Mr. Clute's description that the outer series is wholly composed of fertile, and the inner series of sterile fronds, but this is only partially correct, as, while the fertile fronds always arise from the outside, only a part of the outer series of crosiers develops sporophylls the number varying with the size of the plant; so that the outer series is most accurately described as consisting of both fertile and sterile fronds, while the inner series is always composed of sterile fronds.

Perhaps this may be a little more clearly stated by saying that in the development of the growing plant from the crosiers the sterile fronds lean out at an angle that gradually brings the more erect fertile fronds within the radius of the whole series and thus gives to the mature plant the appearance which has been responsible for a popular error.

This is equally true of the other species of *Osmunda*, both *O. Claytoniana*, and *O. regalis* developing their fertile fronds from the outer row of crosiers, while in *Struthiopteris Germanica* exactly the converse is true the fertile fronds being evolved from within the centre of the vase-like series of sterile fronds.

2. NEW STATIONS FOR *ASPLENIUM EBENEUM*, Aiton, VAR. *HORTONAE*, Davenport. — This very lovely fern which was described in *RHODORA* for January (1901) as a "plumose" variety of the ebony spleenwort from Vermont, appears to have been found as long ago as 1894, by Prof. C. E. Waters at a station on the Gunpowder river near Baltimore, Maryland. Prof. Waters at the time noticed the peculiar cutting of the frond, and made a blue print impression which is now in my possession, and which shows clearly enough the identity of his plant. Recently he has written me that he has seen a single frond of the variety in the Herbarium at Mt. Holyoke without data, but this I cannot personally vouch for.

Another specimen which, through the courtesy of Mrs. Horton, I have seen, was collected by Mr. J. H. Ferriss on Carrion Crow Mt.,

Arkansas, in March (1901). This specimen appears to be much less cut than a careful examination shows it really to be, the deep oblique incisions being very fine and close, but I have not hesitated to refer it to the variety as all of its other characters are those of var. *Hortoniae*.

There is really nothing surprising in the finding of this form at stations so far apart, as, given plenty of *A. ebeneum*, and spore dissemination for factors, there is no reason why similar variations should not follow spore germination wherever the species abounds.

It is not to be expected that in all cases the result should be mechanically identical, as if made by dyes, but considerable divergence is to be looked for. In my own plants, now under cultivation, some of the fronds are beautifully frilled, and feather like in appearance, the incisions being very deep, with the oblique lobes crowded closely together and overlapping one another in a more or less imbricated manner, while the rachises are somewhat flexuose and the lamina gracefully curved.

In some more highly developed fronds from Mrs. Horton the incisions are more open, and some of the pinnae are conspicuously pinnatifid to the centre with the lobes strongly incised, and the halbert-shaped basal ones broadly and deeply pinnatifid, so that the frond is bipinnatifid.

Mrs. Horton notices that in the taller fronds the stalks just above the base are exceedingly brittle, and break off easily much after the manner of the *Woodsias*.

So far this variety has shown no signs of fruiting and is to be regarded as a sterile form, bearing a somewhat similar relation to the normal form of the species as var. *cambricum* does to *Polypodium vulgare*.

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